

*J. S. Cooper*



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Annual Register

OF

THE LEHIGH UNIVERSITY.

1870-'71.

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REGISTER  
OF THE  
OFFICERS AND STUDENTS

OF

The Lehigh University,

SOUTH BETHLEHEM, PENN.,

WITH

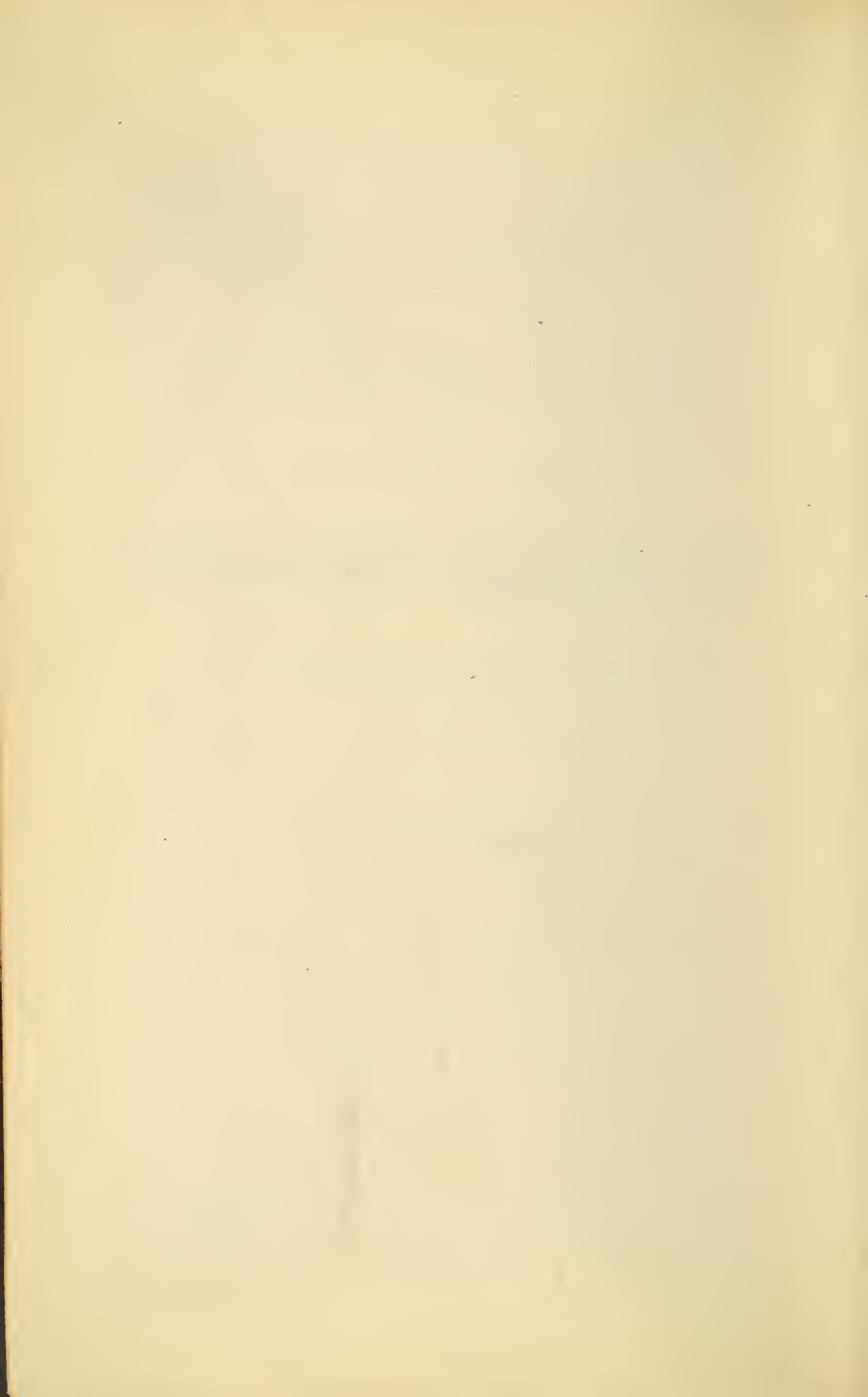
THE PLAN OF ORGANIZATION & THE COURSE OF INSTRUCTION.

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*“Homo Minister et Interpres Naturæ.”*

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PUBLISHED BY ORDER OF THE BOARD OF TRUSTEES.  
1871.



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## FOUNDER OF THE UNIVERSITY.

THE HON. ASA PACKER, OF MAUCH CHUNK, PENN.

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## THE LEHIGH UNIVERSITY.

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ORIGIN.—During the year 1865, the Honorable Asa Packer, of Mauch Chunk, announced, unsolicited, to the Bishop of the Diocese, the Right Reverend William B. Stevens, D. D., LL.D., his intention to appropriate the sum of Five Hundred Thousand Dollars, and an eligible spot in South Bethlehem, containing fifty-six acres (since enlarged by the donation of seven acres by Charles Brodhead, Esq.,) for the purpose of founding an educational institution in the beautiful valley of the Lehigh, which should bear the name of THE LEHIGH UNIVERSITY. The Bishop was appointed President of the Board of Trustees.

DESIGN.—The purpose of the founder in making this munificent endowment was to provide the means for imparting to young men of the Valley, of the State, and of the Country, a complete professional education, which should not only supply their general wants, but also fit them to take an immediate and active part in the practical and professional duties of the time. The system determined upon proposes to discard only what has been proved to be useless in the former systems, and to introduce those important branches which have been heretofore more or less neglected in what purports to be a liberal education, and especially those industrial pursuits which tend to develop the resources of the country,—pursuits, the paramount claims and inter-relations of which natural science is daily displaying,—such as Engineering, Civil, Mechanical and Mining; Chemistry, Metallurgy, Architecture and Construction.

It was further believed that the course of four years, provided for in the old system as the same for all students, was not the best, as many were thus compelled to pursue studies for which, by nature, they were not fitted, and which would be

useless to them in their future professions. While the institution is intended to be of a polytechnic character, the preparatory instruction of two years is designed to fit a young man to pursue any one of the professional courses which he may select.

While such an institution promises to be of peculiar benefit to the Lehigh Valley, and to the numerous other districts of Pennsylvania which are rich in mineral resources of many kinds, its usefulness will not be thus limited; it is intended for the benefit of the whole country; the instruction which it affords will enable its graduates to play intelligent parts in exploring and developing the resources of all portions of the United States, and in applying the various modes of transporting and interchanging them.

**THE SITE.**—It would be difficult to find, anywhere in this country, a locality for educational purposes, which combines so many and such varied advantages as are concentrated on the site of The Lehigh University. Placed upon the gentle declivity of the Lehigh Mountain range in South Bethlehem, which, on that side, encloses the river valley, and in the midst of a noble park of forest trees, **PACKER HALL**, the principal University building, stands three hundred and ninety feet above tide-water, and has a magnificent, unobstructed view—over the Lehigh River and the town of Bethlehem—of the Blue Mountains, twenty miles distant.

**FACILITIES OF COMMUNICATION.**—The site is about half a mile from the Railroad Depot, which stands at the junction of the Lehigh Valley and North Pennsylvania Railroads, and which is on the same side of the Lehigh River. The facilities for reaching the institution are numerous and great. It is fifty-four miles from Philadelphia by the North Pennsylvania Railroad; eighty-seven miles from New York City, by the Lehigh Valley and New Jersey Central Railroads; and it communicates by the Lehigh Valley Road, in the other direction, with the rich and rapidly developing central portions of Pennsylvania. The Lehigh and Susquehanna Railroad is on the left bank of the river from Easton to Scranton; and the Lehigh and Lackawanna Railroad, already in operation to Bath, and graded from that point to the Wind Gap, when completed to Stroudsburg, will there connect with the Delaware, Lackawanna and Western Railroad.

The health of Bethlehem is proverbial. The air is pure and extremely invigorating. The water in the University grounds and buildings is excellent, and free from limestone. The swiftly flowing Lehigh does not produce those ailments which are found on the banks of larger and more sluggish streams.

THE UNIVERSITY BUILDINGS.—Packer Hall, named in honor of the munificent founder, stands seven hundred feet back of Packer Avenue, the front limit of the University grounds; it presents an imposing façade of handsome stone. At the western extremity is a belfry tower, containing the President's room and the Archive room, at the eastern end is a large advanced wing, four stories high, in which are the lecture and recitation rooms. The central portion, eighty feet long, contains the chapel, library and cabinets. The entire length of Packer Hall is two hundred and thirteen feet. In the grounds, descending the hill in *echelon*, are erected the houses of the President and Professors, handsome buildings, which comport architecturally with the great Hall. Situated on Packer Avenue, towards the eastern extremity of the grounds, stands Christmas Hall, a large and commodious brick edifice, containing students' dormitories and a mess hall.

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## GENERAL PLAN.

The courses and subjects of study are set forth and arranged in the following manner:

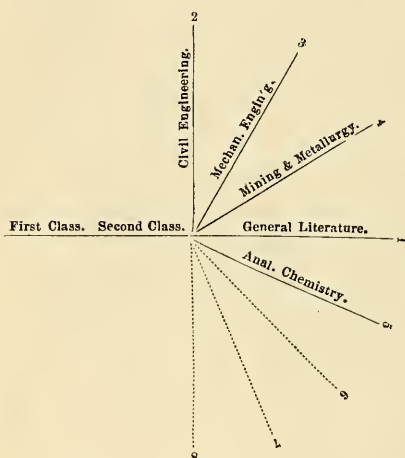
THE FIRST TWO YEARS.—These are devoted by all regular students to the study of those elementary branches in which every young man should be instructed, for whatever profession or business in life he may be intended, viz.: Mathematics, Languages, Elementary Physics, Chemistry, Drawing, History, Rhetoric, Logic, Declamation and Composition.

At the end of two years, having acquired this necessary knowledge, the student, following the bent of his own mind, and aided by his parents and his professors, will be ready to select some special professional course, to which all his studies and efforts will be directed. To enable him to do this there are several technical schools, which branch off from the end

of the common course. In each, the term of study is two additional years, and the student, at his graduation in any one of them, receives a special degree. By this means, a young man is relieved from the overpowering and confusing study of those branches for which he has no taste, and pursues with cheerfulness the special course which he has selected, and for which he is suited by inclination and intelligence.

The students in the first two classes are called *First* and *Second Classmen*. Those in the schools are called *Junior* and

*Senior Schoolmen*. A simple diagram will show the relations of the classes to the schools.



The schools at present provided for are :

1. General Literature.
2. Civil Engineering.
3. Mechanical Engineering.
4. Mining and Metallurgy.
5. Analytical Chemistry.

This scheme will be expanded by the addition of other schools, as indicated by the dotted lines in the diagram. A few preliminary words will explain the nature of the schools.

1. THE SCHOOL OF GENERAL LITERATURE.—In this school, regular students, may continue Latin and Greek, as *elective* studies. Rigorous attention will be paid to French and German Literature, Moral and Mental Philosophy, International Law, Civil Polity, Political Economy and Christian Evidences. There will be extended practice in composition in English, French and German. The earlier instruction in French and German being designed to enable the student to read the language, their further study in this school is intended to make him acquainted with literary and scientific works, and to give him thus a comparative view of the entire field of Modern Literature.

Students who complete the studies of this school shall receive the degree of B. A., (Bachelor of Arts). This school corres-

ponds, with certain important differences, to the course long established in our colleges; many of the studies, however, being of a higher order.

2. **THE SCHOOL OF CIVIL ENGINEERING.**—The general scope of this school comprises the higher branches of mechanics; surveying; topographical engineering; the experimental examination, location, construction, and general management of canals, roads and railways; Geodesy; Hydrography; with so much of Mechanical Engineering as refers to bridges, canal locks and special constructions used in civil engineering; grading, paving, watering, draining and lighting towns. Students in Civil Engineering will have their regular practice in the field, with the use of all necessary instruments, as a rigorous feature of the course.

To this school is also assigned instruction in Architecture and its applications, but with special stress upon those specific kinds of architecture most used around us.

The graduate in this school will receive the degree of C. E., (Civil Engineer).

3. **THE SCHOOL OF MECHANICAL ENGINEERING.**—The studies of this school will comprise the applications of Mechanics to machinery, in the construction of hand, steam and air engines, stationary, locomotive and marine engines, mills of various kinds, furnaces, foundries, rolling mills; the manner of casting and working in iron and other metals, and of making and using the implements employed in these works; the construction and use of various manufactories; agricultural implements and the machinery of the steading, water-works, gas-works, and warming and ventilating apparatus. Much attention will be paid to the drawing of models, and to the analysis and synthesis of machines. The proximity of numerous machine shops and foundries will enable the student to receive practical instruction in all branches of mechanical art, and visits to these will form an important feature in the school of Mechanical Engineering.

The graduate in this school will receive the degree of M. E., (Mechanical Engineer).

4. **THE SCHOOL OF MINING AND METALLURGY.**—In the studies of this school are included Mineralogy and Geology; Metallurgy, with the modes of extracting all metals from ores; the

methods of mining for various ores, with special instructions as to iron, coal, zinc, lead, copper, gold and silver. The aim will be to fit the student for immediate service in the rapidly developing mines of these metals in many parts of our country. The students in this school will be taken to the mines for ocular instruction.

The graduate in this school will receive the degree of E. M., (Engineer of Mines).

THE SCHOOL OF ANALYTICAL CHEMISTRY.—This school will comprise all the operations of chemical analysis, qualitative and quantitative; of inorganic and organic chemistry; the spectroscope; the blow-pipe; assays of every kind; practical problems; the analysis of minerals; mineralogy, geology, metallurgy. The student will have constant practice in the analytical laboratory, under the direction of the Professor.

The graduate in this school will receive the degree of A. C., (Analytical Chemist).

This general statement has been made, divested of details,—which are presented in the programme of studies,—in order to give a clear view of the system, and of the relation sustained between the regular preparatory instruction in the classes, and the special professional instruction in the schools.

In the school of Analytical Chemistry, the study of Physics and Mechanics will be continued from the class years. In the schools of Civil Engineering, Mechanical Engineering and Mining, the study of Physics, Mechanics and Chemistry will be continued from the class years, in such proportion as may be necessary in each. It will thus appear that some of the studies will be the same for two or more of the schools, especially in the Junior Year. In the Senior Year the separate and specific subjects of each school will be studied.

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## PROGRAMME OF STUDIES.

In arranging a programme of studies to suit the needs of education in the present practical age, it was necessary to scrutinize the former systems, and to eliminate those studies which have been long demonstrating themselves to be useless, if not injurious; in no way strengthening the foundations of that

knowledge which the student is to use during his life. It became also necessary, before such changes could be judiciously made, to go back and seek for the true relation which the elementary or foundation studies bear to each other and the system.

It is remarked, in the first place, that *Mathematics*, *Chemistry*, *Physics*, and *Language*, form the basis of a practical education. These studies, while imparting practical knowledge, also secure that discipline of the mind which is essential to future progress.

1. The principles of *Mathematics* underlie all the mechanical processes in nature and art. Too great prominence cannot, therefore, be given to this branch.

2. The study of *Chemistry* and *Physics*, forms the basis of all analysis of nature. Chemistry affords the knowledge of materials, and the modes of combining materials used in construction, and opens and illustrates the subjects of mineralogy and metallurgy; and therefore great importance is given to Chemistry as an *elementary* branch of learning. These being objective sciences, are particularly attractive to young minds, by the number and variety of interesting experiments which are required to illustrate them.

3. It is hardly necessary to dwell upon the vital importance of Language as a means of study in all the arts, and of communication with men. A knowledge of the English Language, as to its structure, and its varied uses in the accurate expression of thought, cannot be too highly estimated. In order to secure this knowledge, Latin and Greek are studied in such a manner as to trace the English derivatives from those languages. French and German are taught with the same view, and further as a means of enabling the student to read the best treatises bearing upon his special studies in the University and his special pursuits hereafter. The student is also taught to speak these languages, that he may readily communicate with the numerous foreigners of every class, with whom he will certainly be brought into contact if he engage in industrial pursuits.

With these views, the following course of studies has been adopted, subject to such alterations and improvements as the progress of science may render necessary.

## REQUIREMENTS FOR ADMISSION.

Applicants for admission into the First Class must be at least *sixteen* years of age, and must present testimonials of good moral character. They will be examined in the following subjects:

*Mathematics.*—Arithmetic complete; Davies' Bourdon's Algebra, through equations of the second degree. First four books of Legendre's Geometry.

*English.*—Correct spelling, to be determined by writing from dictation in idiomatic English. Mitchell's School Geography. Parker's English Grammar.

*Latin.*—The elements of Latin Grammar, with the rules of Syntax. Four books of Cæsar's Commentaries.

This examination will be rigorous, and no student will be permitted to enter in full standing who is deficient in these branches.

## STUDIES OF THE FIRST CLASS.

*First Term.*

*Mathematics.*—Davies' Bourdon's Algebra completed.

*Physics.*—Chemical Physics; Lectures and Text Book.

*English Studies.*—Weber's Outlines of Universal History. Lectures on American History. Essays written extemporaneously under the eye of the Instructor. Declamations in the Chapel.

*Latin.*—Review of Latin Grammar and Cæsar's Commentaries—five books.

*Greek.*—Greek Grammar.

*German.*—Peissner's Grammar, with Lectures. Adler's Reader. Writing in German letters. Translation of German into English.

*Drawing.*—The use of the pencil and pen in free hand drawing. Elements of Topography.

*Second Term.*

*Mathematics.*—Davies' Legendre's Geometry completed.—Plane Trigonometry, Spherical Trigonometry and Mensuration: use of logarithmic tables.

*Physics.*—~~Brocklesby's Physical Geography.~~

*Chemistry.*—Lectures on the Principles of Chemistry. Metalloids. Wetherill's Lecture Notes.

*English Studies.*—Coppée's Elements of Logic. Compositions carefully prepared. Declamations in the Chapel. A silver medal is given to the student who shall be adjudged to have made the best declamations throughout the year.

*Latin.*—Arnold's Latin Prose Composition.

*Greek.*—Greek Grammar, and reading in Historical Selections.

*German.*—Adler's Reader, continued. Translation of English into German. Exercises in Conversation.

*Drawing.*—Topographical Drawing, and the use of instruments.

#### STUDIES OF THE SECOND CLASS.

##### *First Term.*

*Mathematics.*—Church's Analytical Geometry, Determinate and Indeterminate.

~~*Physics.*—Ganot's Physics, with Lectures: Somatology and Acoustics.~~

*Chemistry.*—Lectures on the Principles of Chemistry. Metals: Wetherill's Lecture Notes.

*English Studies.*—Coppée's Rhetoric. Lectures on the English Language. Compositions and Declamations.

*Latin.*—Cicero De Amicitia.

*French.*—Translations from English into French. Resume of the rules of Syntax. Copious exercises in French Idioms.

*German.*—Translation of English into German. Affinity of English and German. Exercises in Conversation.

*French.*—Collot's French Grammar, with a course leading from the construction of easy sentences to composition and conversation. Chapsal's Litterature Française.

*Drawing.*—Topography with colors. Pen and ink etchings.

##### *Second Term.*

*Mathematics.*—Church's Differential Calculus, Integral Calculus, and Calculus of Variations. Surveying with practice in the field.

*Physics.*—Heat and the Steam Engine.

~~*Electricity & Magnetism*~~  
~~*Acoustics & Optics*~~  
~~*Metallurgy & Chemistry*~~

*Chemistry*.—Lectures on the Principles of Chemistry. Organic Compounds: Wetherill's Lecture Notes.

*English Studies*.—Constitution of the United States. Compositions and Declamations. Cutter's Physiology.

*French*.—Chapsal's Littérature Française, continued. French Compositions and a course to enable the students to read the scientific French works used in the different schools of the University. Declamations in French.

*Drawing*.—Elements of shading in Colors, and Protractions of Surveys.

These studies complete the preparatory two years which fit a young man to enter one of the special professional schools.

## THE SPECIAL SCHOOLS.

The following is presented as the general programme of instruction in these schools:

REQUIREMENTS FOR ADMISSION.—Students who have passed successfully through the First and Second Classes, may be admitted into any one of the Schools. All other applicants for admission into one of the Schools must pass a satisfactory examination on the subjects studied in the first and second class years, and must be at least eighteen years of age. Graduates of any College in good standing, will be received without an examination.

### 1.—SCHOOL OF GENERAL LITERATURE.

*Junior Schoolmen.*

*Physics*  
~~Mechanics.~~ Weisbach's. *Mechanics*  
~~Physics.~~ Ganot's Treatise on Physics continued and finished.  
~~Electricity~~ *Electricity*; Electricity; Meteorology. *Acoustics & Optics*

*Moral Philosophy*.—Whewell's Elements of Morality.

*History*.—The History of the United States: References to Bancroft, Hildreth, Curtis's Constitutional History. Lectures on the Philosophy of History.

*Languages*.—Rhetorical studies in English. Declamation of original pieces. Themes. Colloquies. Lectures on English Literature. French readings from Molière, Corneille and

other writers. German readings from Schiller:—Wallenstein, Don Carlos and Maria Stuart.

*Drawing*.—Landscape Painting, and Painting in Oil, at the option of the student.

*Senior Schoolmen.*

~~*Physics and Astronomy*~~.—Loomis' Treatises on Descriptive and Practical Astronomy. Attendance in Observatory.

*History*.—English Constitutional History. The Student's History of France.

*Languages*.—French and German readings continued. Lectures on the comparative literature of the modern languages. References to Schlegel, and to Longfellow's Poets and Poetry of Europe.

*Christian Evidences*.—Lectures by the Professor.

*Intellectual Philosophy*.—Hamilton's Metaphysics.

*Civil Polity*.—Political Economy. International Law. References to Kent, Halleck and Woolsey. General Government and State Jurisdiction.

*Rhetorical Studies*.—Theses in English, French and German. Declamation of original pieces in these languages.

*Optional Studies in the School of General Literature*.—Greek and Latin may be continued, or Italian and Spanish may be studied, as the student may desire.

2.—SCHOOL OF CIVIL ENGINEERING.

*Junior Schoolmen.*

~~*Mathematics and Mechanics*~~. <sup>*Physics*</sup> ~~(First Term.)~~ Descriptive Geometry; Spherical Projections, Shades and Shadows, and Perspective (Church); Axonometric Projections. ~~One planed Descriptive Geometry.~~ (Second Term.)—Mechanics: Mathematical theory of motion; science of motion in general. Statics, Dynamics and Equilibrium of bodies. Theory of centre of gravity and moment of inertia and statics of fluids; Weisbach.

~~*Moral Philosophy*~~.—Whewell.

*Physics*.—Ganot's Treatise on Physics;—Light; ~~Heat~~; <sup>*magnetism*</sup> Electricity; Meteorology. <sup>*Acoustics & Optics*</sup> ~~Baromet~~

*Mineralogy and Geology*.—Dana's; with the use of the museum.

*Surveying*.—Topographical Surveying. Surveys of rivers and harbors. Deep sea soundings. Use of the sextant, theo-

dolite, solar compass, transit, level, rod and chain, in actual surveys.

*French and German.*—Throughout the year.

*Drawing.*—Topographic and Hydrographic maps. Problems in Descriptive Geometry. Bridges and Culverts.

*Senior Schoolmen.*

*Engineering and Architecture.*—(First Term.)—Elasticity and strength of materials; dynamics of fluids and theory of oscillation, Weisbach. Rankine's Civil Engineering, including strength of materials and forms of maximum strength; use of prismatic compass, pocket-level and micrometer scale in reconnaissance; use of compass, plane-table, level, transit, theodolite, solar compass and sextant, in preliminary surveys, location and construction of roads, railways, canals, &c.; in surveys of public lands, boundary lines of States, and in topographic and hydrographic surveying generally. (Second Term). Special constructions, as Bridges, Viaducts, Aqueducts, Docks, Locks, Weigh-Locks, &c.; the Steam Engine and Locomotive; Depot, Round-house and Station-house; computing strength and determining proportions of structures and their parts; excavation and embankment, rock-cutting, tunnelling, quarrying, &c.; supply and drainage of water; grading, paving, watering, draining and lighting towns; warming and ventilation; estimating cost of work; management of public works, and keeping constructions, repair, and freight accounts. Field-notes, office-books, and use of computing tables. Stereotomy: Grecian, Roman and Modern Architecture.

*Physics and Astronomy.*—Loomis' Treatises on Descriptive and Practical Astronomy. The use of the Sextant, Portable Meridian Circle and Zenith Sector. Attendance in the Observatory with the Professor.

*Chemistry applied to the Arts.*—Lectures on the Chemistry of Building Materials.

*Christian Evidences.*—Lectures by the Professor.

*French and German.*—Throughout the year.

*Drawing.*—(First Term.)—Mapping, profiling and cross-sectioning railways and other works. Bridges and Canal locks. (Second Term.)—Applications of Descriptive Geometry to carpentry, stone-cutting, masonry, domes, groined and cloistered arches, &c.

## 3.—THE SCHOOL OF MECHANICAL ENGINEERING.

*Junior Schoolmen.*

*Mathematics and Mechanics.*—Same as in School of Civil Engineering, with work in the machine shops.

*Moral Philosophy.*—Whewell.

*Physics.*—Same as in School of Civil Engineering.

*Mineralogy and Geology.*—As in School of Civil Engineering.

*Metallurgy.*—The processes of reducing ores.

*French and German.*—Throughout the year.

*Drawing.*—Models of special Machines. Problems in Descriptive Geometry.

*Senior Schoolmen.*

*Engineering.*—Reference to Moseley's Mechanics of Engineering. Rankine's applied Mechanics. Steam and Locomotive Engines; Auchincloss' Link and Valve Motion; Air Engines; various kinds of boilers; their construction, strength and safety. Hydraulic Engines. Construction of furnaces, foundries and rolling mills. Machines used in agriculture. The cotton gin; sugar factories and refineries. Printing presses; types and type metal. Quarrying, and the machinery used. Planing and sawing machines. Methods of employing men and keeping their accounts. Work in Machine Shop.

*Physics and Astronomy.*—Same as in School of General Literature.

*Chemistry applied to the Arts.* Lectures on the Chemistry of Building Materials.

*Christian Evidences.*—Lectures by the Professor.

*Mineralogy.*—Lectures continued.

*French and German.*—Throughout the year.

*Drawing.*—Plans, sections, and elevations of the machinery in the Bethlehem Rolling Mill, and in the Zinc Works. Photography of machines.

## 4.—SCHOOL OF MINING AND METALLURGY.

*Junior Schoolmen.*

*Mathematics and Mechanics.*—Same as in School of Civil Engineering.

*Moral Philosophy.*—Whewell.

*Physics.*—Same as in School of Civil Engineering.

*Chemistry.*—Work in laboratory; qualitative analysis.

*Mining.\**—The useful minerals and the nature of their deposits. Examination of the properties by surface indications, trenching, boring, tunneling, opening of mines, sinking, timbering and walling of tunnels and galleries. Construction of dams and stoppings. Working of mines, open air mining, mining of mineral veins, Coal mining, Salt mining. Ventilation, nature of gases found in mines, natural and artificial ventilation; furnaces, mechanical ventilators; distribution of air in mines; measurement of ventilation and work done by ventilators. Lighting of mines by gas, lamps, safety lamps, &c.

*Geology.*—Physical Geography, Geognosy, Palæontology, Bed, strata, seams. Workable coal beds. Lodes or mineral veins. Dislocations and rules for finding the dislocated or lost portions of a deposit.

*Mineralogy.*—Dana's. Lectures by the Professor. Crystallography. Analysis of metallic ores; iron, copper, lead, zinc, gold, silver, and of coal, &c. Access to the mineralogical cabinet.

*French and German.*—Throughout the year.

*Drawing.*—Crystals. Maps of geological and mineralogical surveys. Plans of machines used in mining. Problems in Descriptive Geometry.

#### *Senior Schoolmen.*

*Engineering.*—Rankine.

*Metallurgy.*—Methods of reducing all ores. Access to the Metallurgical Cabinet, with illustrative lectures.

*Mining.*—Fires in mines, means of preventing and extinguishing them. Accidents in mines, means of preventing them. Underground transportation, hoisting or winding; engines, drums, ropes, brakes, safety catches, man ~~engines~~. Pumps and pumping machinery. Mechanical preparation of minerals, coal breakers, stamps, crushers, screening, washing and dressing of coal and other minerals. Mine surveying, drawing of plans and sections of mines, and mine machinery. General management of mines, &c. Practical instruction at the mines. Thesis, plans, estimates, &c., for the establishment and working of mines under given conditions.

\* Students visit mines of various ores at stated times under the charge of Mr. Rothwell, the Demonstrator of Mining.

*Chemistry applied to the Arts.*—(First Term.) Lectures on the chemistry of building materials. Work in laboratory. Quantitative analysis. (Second Term.) Metallurgical Assays.

~~Physics and Astronomy.~~—Same as in School of General Literature.

~~Christian Evidences.~~—Lectures by the Professor.

~~French and German.~~—Throughout the year.

*Drawing.*—Plans, sections and elevation of mines. Machines used in mining.

## 5.—SCHOOL OF ANALYTICAL CHEMISTRY.

### *Junior Schoolmen.*

*Mechanics.*—~~Weisbach.~~ *and Physics*

~~Physics.~~—Same as in School of General Literature.

~~Moral Philosophy.~~—Whewell.

*Chemical Analysis.*—(First Term.) Qualitative, Fresenius. (Second Term.) Quantitative, Fresenius.

*General Chemistry.*—(First Term.) Miller's Inorganic. (Second Term.) Miller's Organic.

*Geology.*—The same course as in the School of Mining.

*Mineralogy.*—Dana's, and lectures with access to Cabinet.

*French and German.*—Throughout the year.

### *Senior Schoolmen.*

*Chemical Analysis.*—(First Term.) Quantitative completed. Volumetric Analysis, Mohr. Organic Analysis. Determination of Vapor Densities. (Second Term.) Gas Analysis, Bunsen. Chemical research, and preparation for Thesis.

~~Physics and Astronomy.~~—The same as in School of General Literature.

~~Christian Evidences.~~—Lectures by the Professor.

*French and German.*—Throughout the year.

REMARK.—Students who may take a *partial course* in any one of these schools, will not receive the degree, (which is only given for the full course,) but will be presented with a certificate of what they have accomplished.

SPECIAL INSTRUCTION.—Students who desire it may have instruction in Music, at extra charge.

## THE UNIVERSITY YEAR.

The University Year is divided into two terms: the first term opens on the first of September, and ends on the first of February. The second term opens on the third of February, and ends on University day. There is a short Christmas vacation, beginning on the twenty-second of December, and ending on the third of January; and a short Easter vacation, from the Thursday before Easter to the Monday after Easter Monday. From the twenty-fifth of June to the first of September shall be the long summer vacation. All exercises shall also be suspended during the hours of divine service, on Ash Wednesday and on Thanksgiving Day. Except on special occasions, there shall be no other vacations during the year.

**DAILY EXERCISES.**—The bell will be rung daily at twenty minutes before nine o'clock, A. M. All the students will assemble at a quarter before nine, to attend the religious exercises, which will be conducted by the President, or in his absence by one of the Professors in the order of seniority. The arrangement of seats is in alphabetical order, and every student shall retain his seat during the term, unless he receive special permission from the President to change it. All absentees are noted by the University Instructors.

**CHAPEL EXERCISES.**—The exercises in the chapel consist of Scripture reading, sacred music and prayers, after which there shall be declamation of selected pieces (daily, except Sunday,) by the students in regular routine. This will cause the first hour of recitation or lecture to begin at about nine o'clock.

**RECITATION HOURS.**—To all lectures each class goes in a body. For purposes of recitation, the classes, according to the number of students in each, are divided into two or more sections, to secure the special attention of the instructor to the daily exercise of each student.

As soon as the students are dismissed from chapel, they proceed in class or in sections to their recitation rooms, according to the accompanying roster, in which "A" represents the first class, "B" the second, "C" the Junior Schoolmen, and "D" the Senior Schoolmen. (See page 24.)

Greek is discontinued at the end of the first year ; the hours thus relieved are given to German, as are also some hours taken from Latin and French. The arrangement of the roster gives four hours of University exercises—recitations, lectures and drawing—daily to each student. There is but one hour of recitation on Saturday—from nine to ten.

**STUDY HOURS.**--Study hours, announced by the ringing of the bell, will be from seven to nine, P. M., during the first term ; and from half-past seven to half-past nine, P. M., during the second term. During this time, students are required to be in their rooms, unless they receive permission of absence from the President, and they will not leave their rooms again during the night.

**SUNDAY EXERCISES.**—Every student is required to attend Divine Service on Sunday morning. The bell will be rung at ten o'clock, A. M., when the students will proceed to the Church of the Nativity, where free seats are provided for them. Any student who presents the written request of his parent that he may attend another place of worship, will receive special permission from the President to do so. Sunday must be observed by a quiet and orderly demeanor. No games shall be played, nor shall the students go upon the river or ride or drive on that day, except for some necessary purpose. Reverent demeanor in church is particularly enjoined and will be enforced.



## ADMISSION OF STUDENTS.

Application for admission into the University should be made to the President, from whom all information may be obtained.

REGULAR STUDENTS.—All applicants for regular standing in the classes or schools, must be prepared to pass an examination according to the programme of studies just given. From this it will be seen that a student may be admitted at any time, if able to pass a satisfactory examination in the studies already pursued by his class.

PARTIAL STUDENTS.—Any young man of good moral character, and of the required age, may enter as a partial student, selecting such studies as he pleases, with the sanction of the President.

CONDITIONAL STUDENTS.—Any young man who is partially, but not thoroughly, prepared to enter in full standing in either class, *may be admitted conditionally to make up his deficiencies by extra study under the care of a Professor or Instructor.* When they are made up he will be received into full standing in his class.

PREPARATORY CLASS.—Students, who have reached their fifteenth year, are received, in a preparatory class, and fitted for admittance into the next regular class.

GRADUATES OF COLLEGES, in good standing, will be received into any of the Schools without a preliminary examination. But in no other case shall a student be admitted without passing an examination on the studies which have been pursued by the class.

FOUNDATION SCHOLARSHIPS.—There are three Foundation Scholarships in each class, to which the scholars, being nominated by the Founder, are appointed by the Trustees. No student shall be a Foundation Scholar without passing a satisfactory examination, nor can he retain his scholarship without taking the full University course in the two classes and in one of the Schools. A Foundation Scholarship entitles the holder to room-rent and tuition, both free.

COMPETITION SCHOLARSHIPS.—There are, in the University, two Competition Scholarships for each class,—First and Second,—which entitle the holders to room-rent, and tuition and

board, free. These are conferred upon the two students in each class standing highest in general merit at the end of the academic year; *i. e.*, the amount of board and tuition is refunded to them on University day.

Any holder of a scholarship (Foundation or Competition,) who shall incur the censure of the Faculty for neglect of studies, misbehavior or irregularity, may, at their discretion, forfeit his scholarship.

OTHER SCHOLARSHIPS.—Any person or corporation may, by permission of the Board of Trustees, endow a scholarship by the payment of —— dollars into the Treasury of the University. The Scholarship shall bear the name of the person or corporation endowing it, who shall also nominate a student, and such student shall be appointed to it, provided he pass his examination, and his admission and residence are sanctioned by the President.

The arrangements for *partial students* have also special reference to young men who, from the force of circumstances, have not disposition, time, or means for a full course, but who desire to gain in a limited time, as much technical and practical knowledge as they can in a special department. Among these are many who, while obliged to labor daily, can only devote a small portion of their time to study. Such are invited to come and learn what they can, and they will have such inducements presented to a continuance and increase of their studies, as their earnestness, industry, and proficiency may warrant.

MODES OF INSTRUCTION.—The instruction, in all parts of the University course is, principally, by text-books with supplementary lectures. The use of text-books enables the student to revise his lessons by references to his books. All supplementary instructions will be written by the student in his notebook, or problem-book, which will be produced at review and examination.

LIBRARY.—The Library of the University shall be for the use of the members of the Board of Trustees, the President, Professors, and all officers, and the students of the University. It shall be open every day, except Saturday and Sunday, from ten to twelve, A. M., and from three to five, P. M. It is designed also as a reading-room for the students in the hours between their recitations. Students whose rooms are at a distance from the University may thus have a commodious place for study.

A Librarian, appointed by the Trustees, shall have charge of the Library; and remain in it during the hours mentioned; he will be responsible for its order and police; and shall make an annual report to the President of its condition, accompanied with a list of books procured during the year, whether by donation or purchase; if the latter, from whom purchased, and at what prices. He shall keep a manuscript catalogue, in which the books shall be twice arranged: alphabetically, and according to subjects.

Books of general reference, which shall be separately catalogued, such as atlases, encyclopædias, dictionaries, catalogues, and other books of great rarity or value, shall not be taken from the Library without the written permission of the President.

Persons not connected with the University may, under certain restrictions, obtain permission to consult books in the Library.

Students may take out two books at a time, to be retained not longer than four weeks. No book shall be lent by a student; and all books must be returned before the end of the term. Students desiring to consult books will ask the Librarian for them, and not take them from the shelves without his permission.

There shall be no loud talking or disorder of any kind in the Library. All damages to books shall be assessed by the Librarian, under an established tariff. All books lost or destroyed will be replaced at the expense of the loser or destroyer.

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## OBSERVATORY.

By the liberality of Robert H. Sayre, Esq., one of the trustees of the University, an Astronomical Observatory has been erected on the University grounds and placed under the care of the Professor of Physics and Astronomy, for instruction of students in Practical Astronomy.

The Observatory contains an Equatorial, by Alvan Clark, of six inches clear aperture, and of eight feet focus; a Zenith Sector, by Blunt; a Superior Astronomical Clock, by William Bond & Sons; a Meridian Circle and a Prismatic Sextant, by Pistor and Martins.

## THE LEHIGH JUNTO.

A literary society bearing the name of the "Lehigh Junto" has been organized by the students and meets weekly. Students are admitted by election. The members of the Board of Trustees and the Faculty are honorary members of the Junto. Besides the weekly meetings, there are public exercises of the society on special occasions.

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### EXPENSES.

**BOARDING.**—A limited number of rooms are provided in the University buildings, to be occupied by students, and arrangements have been made for a mess-hall, where any or all may board in messes of about thirty each; but students may board and lodge in any part of the town, provided the houses they select meet the approval of the President.

The rooms in the University buildings are rent free; but each student provides his own furniture. The board in the mess-hall is furnished at as low a rate as possible.

**FEES.**—In carrying out the view of the Founder, to confer the benefit of the institution upon as large a number of worthy young men as possible, while the highest standards of instruction and scholarship will be maintained, the tuition fees are less than in most other institutions of a similar character. In the First and Second Classes, the fees are \$50 per term; in all the Schools of Special Instruction, except Analytical Chemistry, \$75. In Analytical Chemistry the fee is \$87.50. Proportional charges will be made to partial students. All fees are payable in advance. The following are the approximate charges:

Tuition .....	\$100	.....	\$150
Board (40 weeks at about \$5).....	200	.....	200
Books .....	20	.....	20
Washing .....	25	.....	25
	\$345		\$395

Books, materials, paper, pencils, chemical materials used in the analytical laboratory and instruments are furnished at the expense of the student.

**DIPLOMAS AND CERTIFICATES.**—The Diploma is given only to those who have passed through the regular course in the Classes and one of the Schools. For all partial courses, a certificate is given of what the student has accomplished.

The fee for the diploma on graduation in any one of the Schools is \$10, payable before receiving it; and no student shall receive a diploma until all his dues to the University are paid.

GRADUATING ESSAYS.—Every student, in each of the Schools, will be required to present a written essay upon some topic connected with his special school, as a necessary portion of the exercises for his final examination for a diploma. These essays shall be accompanied by drawings and diagrams, when the subject needs such illustration. The originals will be kept by the University, as a part of the student's record, for future reference; but a copy may be retained by the student, and be published, permission being first obtained from the President.

UNIVERSITY DAY AND EXHIBITIONS.—The day following the close of the Annual Examination shall be known as UNIVERSITY DAY. Upon this day the "Annual Exhibition of Graduates" shall take place in the University Chapel, in the presence of the Trustees, Faculty, and invited guests. The exercises shall consist of orations by Junior and Senior schoolmen, and an address to the students by the President or some other member of the Faculty. Every student must perform the duty assigned to him, unless excused by the President.

On some other day, annually appointed, the University Oration will be pronounced by some distinguished person invited to do so.

The University Sermon will be preached on the Sunday before University day, under the direction of the President and the Reverend Professor of Christian Evidences.

PHYSICAL EXERCISE.—A large and complete Gymnasium will be provided, which will be open to all students who subscribe a small sum to keep it in proper repair.

An unobstructed stretch of water for several miles above the town of Bethlehem and below affords excellent opportunities for the manly and admirable exercise of the oar.

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## RESIDENT GRADUATES.

A limited number of graduates, who desire to pursue their studies under the general direction of the Faculty, may be allowed the use of the Library, and may attend lectures in any

of the departments, during a term of three years, free of expense. Although not bound by University hours, they will be required to obey the directions of the President, and of the Professors in reference to their departments; will board and lodge only in places sanctioned by the President, and will have their names placed upon the Annual Register.

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## PRIZES.

*To be awarded in 1871.*

A gold medal for the best essay in the Second Class. Subject: "*The Lehigh Valley.*"

A silver medal for the best declamation of a selected piece in the First Class.

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## AWARDS ON "UNIVERSITY DAY."

JUNE 23, 1870.

The gold medal for the best essay on "*The Lehigh Valley,*" in the Second Class, presented by Charles Brodhead, Esq., was not awarded this year.

The silver medal for the best declamation of a selected piece in the first class, presented by Bishop Stevens, was awarded to  
GEORGE M. CUMMING.

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## THE UNIVERSITY SERMON

Was preached in the Church of the Nativity, on Sunday, June 10th, by the Rev. BENJAMIN WATSON, D.D., of Philadelphia.

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## STUDENTS OF THE UNIVERSITY.

## FIRST CLASS.

*Entered September 1, 1870.*

William Atkins,.....	Pottsville.
Charles S. Beardsley,.....	Lock Haven.
George C. Haldeman,.....	Chickie's Furnace.
John H. W. Hawkins,.....	Chambersburg.
William A. Jones,.....	Bethlehem,
Rodolphus Kent, Jr.,.....	Gwynedd.
Irvin Krause,.....	Philadelphia.
Julius P. Meyer,.....	Fond du Lac, Wis.
Robert Mitchell,.....	Lebanon.
Joaquin de Moraes,.....	Rio Janeiro, Brazil.
John E. Rathbun,.....	Trevorton.
Charles Rowe,.....	South Bethlehem.
Ernesto Ribeiro dos Santos,..	San Paulo, Brazil.
G. Herbert P. Stearns,.....	Elizabeth, N. J.

## SECOND CLASS.

*Entered September 1, 1869.*

Joseph B. Baker,.....	Thorndale.
Washington H. Baker,.....	Philadelphia.
Robert B. Claxton,.....	Philadelphia.
George M. Cumming,.....	Pottsville.
William C. Foulks,.....	Philadelphia.
Henry Ivan Harris,.....	Astoria, N. Y.
William Hewitt,.....	Trenton, N. J.
James P. S. Lawrance,.....	Philadelphia.
Thomas Merritt,.....	Morristown, N. J.
Allen K. Rahme,.....	Pittsburg.
*Murray Rush,.....	Chestnut Hill.
Wallace M. Scudder,.....	Trenton, N. J.
George B. Thomas,.....	Media.

COMPETITION SCHOLARSHIPS AWARDED TO

George M. Cumming and William Hewitt.

\* On leave of absence.

## JUNIOR SCHOOLMEN.

*Entered September 1, 1867.*

## IN THE SCHOOL OF GENERAL LITERATURE.

Harvey S. Houskeeper,.....South Bethlehem.

## IN THE SCHOOL OF CIVIL ENGINEERING.

George Pierrepont Bland,....Manayunk, Philadelphia.

Daniel P. Bruner,.....Columbia, Lancaster County.

Henry St. Leger Coppée,.....South Bethlehem.

Lentz Edmund Klotz,.....Mauch Chunk.

Henry W. Morgan,.. ....Blackwoodtown, N. J.

Henry D. Scudder,.....Trenton, N. J.

## IN THE SCHOOL OF MECHANICAL ENGINEERING.

Raymundo Floresta de Miranda, Pará, Brazil.

## IN THE SCHOOL OF ANALYTICAL CHEMISTRY.

Hildebrando Barjona de Miranda, Pará, Brazil.

Christian Degenhardt,.....Tresckow, Carbon Co.

Oscar M. Lance,.....Plymouth, Luzerne Co.

## COMPETITION SCHOLARSHIPS AWARDED TO

George Pierrepont Bland and William G. Clapp.

## SENIOR SCHOOLMEN.

*Entered September 1, 1867.*

## IN THE SCHOOL OF GENERAL LITERATURE.

William Hull McCarthy,.....New Haven, Conn.

## IN THE SCHOOL OF CIVIL ENGINEERING.

Frank Laurent Clerc,.....Philadelphia.

Alfred Gilmore,.....Lenox, Mass.

James S. Polhemus, Jr.,.....New York City.

Charles G. Weaver,.....Carlisle.

## IN THE SCHOOL OF MINING AND METALLURGY.

Henry S. Drinker,.....Philadelphia.

## IN THE SCHOOL OF ANALYTICAL CHEMISTRY.

Edward F. Fassitt, .....Philadelphia.

## COMPETITION SCHOLARSHIPS AWARDED TO

Frank L. Clerc and William H. McCarthy.

## RESIDENT GRADUATES.

William R. Butler, M. E.....Mauch Chunk.

George A. Jenkins, A. C.....South Bethlehem.

## CALENDER.

## FIRST TERM.

Opened Thursday, September 1, 1870.

Christmas Vacation begins on the afternoon of Wednesday, December 21, 1870, and ends on Tuesday, January 3, 1871.

First term ends on Wednesday, February 1, 1871.

## SECOND TERM.

Opens Friday, February 3, 1871.

Easter Vacation begins on Thursday, April 16, and ends on Tuesday, April 18, 1871.

The Annual Examination opens on Friday, June 9, and ends on Wednesday, June 21, 1870.

"UNIVERSITY DAY."—Thursday, June 22, 1871.

Summer Vacation begins on Friday, June 23, and ends on Friday, September 1, 1871, when the new Academic year begins.

Prize essays, Second Class, to be handed in before June 14.

Prize declamation, First Class, Wednesday, June 21.

Students examined for admission into the University on Tuesday, the 20th of June, and on Monday the 28th of August.

University Sermon—Sunday, June 18.

When properly mapped out  
I shall want

1<sup>st</sup> Clap - Chem Physics Text book  
(1 term) and lectures

2<sup>d</sup> Clap Nothing 1<sup>st</sup> term

2<sup>d</sup> term - Heat. Electricity & Magnetism  
Towles & Muller

3<sup>rd</sup> term Clap

1<sup>st</sup> term Mechanics Masbach

2 " Acoustics & Optics Bortle



